

## CLAIMS

1. System for sensing at least one characteristic parameter of a tyre fitted to a vehicle comprising:
  - 5       • a movable unit combined with said tyre,
  - said movable unit comprising a device for sensing said at least one characteristic parameter and a device for transmitting out of the tyre a signal relating to said at least one characteristic parameter,
  - 10       • a fixed unit combinable with said vehicle that includes a device for receiving signals from said movable unit,
  - characterized in that
  - said movable unit comprises a processing unit and a
  - 15       storage device that carry out a pre-processing of a signal generated by said sensing device and send said pre-processed signal to said transmitting device.
2. System according to Claim 1, in which said movable  
20       unit comprises an electrical energy generating device capable of supplying said processing unit and said transmitting device.
3. System according to Claim 1, in which said storage  
25       device comprises at least one pre-stored procedure capable of performing said pre-processing of said signal.
4. System according to Claim 1, in which said signal  
30       relating to said at least one of said characteristic parameters is converted into a digital signal by said processing unit.
5. System according to Claim 1, in which said sensing  
35       device, said transmitting device, said processing unit and said storage device are produced on a substrate.
6. System according to Claim 5, in which said movable unit is made by a MEMS technology.

7. System according to Claim 1, in which said generating device comprises a capacitor that charges itself with electrical energy in response to the mechanical stresses applied to said tyre.
8. System according to Claim 7, in which said capacitor comprises a fixed plate and a movable plate which move with respect to each other in response to said stresses.
9. System according to Claim 8, in which said fixed plate and said movable plate vary their distance from each other in response to said stresses.
10. System according to Claim 8, in which said fixed plate and said movable plate are connected to each other by a pair of springs.
11. System according to Claim 8, in which said fixed plate and said movable plate are connected to a fixed support and to a movable support, respectively.
12. System according to Claim 8, in which the movement of this movable plate is bounded by a pair of end stop elements.
13. System according to Claim 1, in which said sensing device, said transmitting device, said processing unit and said generating device are produced on a substrate.
14. Method for sensing at least one characteristic parameter of a tyre fitted to a vehicle comprising the following steps:
- sensing inside said tyre a signal relating to said at least one characteristic parameter,
  - processing inside said tyre said signal using procedures pre-stored in a storage device, and
  - transmitting the processed signal out of said

tyre.

15. Method according to Claim 14, in which said  
processing step includes the step of digitizing this  
5 signal.

16. Method according to Claim 14, in which said  
processing step includes the step of filtering this  
10 signal.

17. Method according to Claim 14, in which said  
processing step includes the step of comparing this  
signal with a threshold value pre-stored in said  
storage device.  
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18. Movable unit for sensing at least one  
characteristic parameter of a tyre fitted to a vehicle  
comprising, a device for sensing said at least one  
characteristic parameter and a device for transmitting  
20 out of the tyre a signal relating to said at least one  
characteristic parameter,  
characterized in that it comprises  
a processing unit and a storage device that carry out a  
pre-processing of a signal generated by said sensing  
25 device and send said pre-processed signal to said  
transmitting device.

19. Vehicle wheel comprising  
- a tyre,  
30 - a supporting rim for said tyre,  
- a movable unit combined with said tyre, a device  
for sensing at least one characteristic parameter  
of said tyre and a device for transmitting out of  
the tyre a signal relating to said at least one  
35 characteristic parameter,  
characterized in that said movable unit comprises  
a processing unit and a storage device that carry out a  
pre-processing of a signal generated by said sensing  
device and send said pre-processed signal to said  
40 transmitting device.